Anadarko Petroleum Corp.

Weld County, CO (NAD 83)
Sec. 5-T8N-R66W
Christner 8-66-5-3H
Plan A Rev 5 SideTrack

Survey: Sperry MWD Surveys (Sidetrack)

Survey Report - Geographic

09 December, 2011

HALLIBURTON
Sperry Drilling

Halliburton Company
Survey Report - Geographic

HALLIBURTON
Sperry Drilling

Company:	Anadarko Petroleum Corp.	**Local Co-ordinate Reference:**	Well Christner 8-66-5-3H
Project:	Weld County, CO (NAD 83)	**TVD Reference:**	RKB 25' @ 5217.00ft (H&P 308)
Site:	Sec. 5-T8N-R66W	**MD Reference:**	RKB 25' @ 5217.00ft (H&P 308)
Well:	Christner 8-66-5-3H	**North Reference:**	True
Wellbore:	Plan A Rev 5 SideTrack	**Survey Calculation Method:**	Minimum Curvature
Design:	Sperry MWD Survey	**Database:**	EDM 2003.16 Single User Db

Project Weld County, CO (NAD 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Sec. 5-T8N-R66W

Site Position:		**Northing:**	1,497,026.33 ft	**Latitude:**	40.695658
From:	Lat/Long	**Easting:**	3,192,649.20 ft	**Longitude:**	-104.805250
Position Uncertainty:	0.00 ft	**Slot Radius:**	"	**Grid Convergence:**	0.45 °

Well Christner 8-66-5-3H

Well Position	**+N/-S**	0.00 ft	**Northing:**	1,497,026.32 ft	**Latitude:**	40.695658
	+E/-W	0.00 ft	**Easting:**	3,192,649.20 ft	**Longitude:**	-104.805250
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	5,192.00 ft	**Ground Level:**	5,192.00 ft

Wellbore Plan A Rev 5 SideTrack

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2011	2011.10.11	8.85	67.26	53,211

Design Sperry MWD Survey

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	183.533

Survey Program **Date** 2011.12.09

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
1,047.00	7,471.00	Sperry MWD Surveys (Original Hole) (Plar	MWD	MWD - Standard
6,749.00	11,420.00	Sperry MWD Surveys (Sidetrack) (Plan A	MWD	MWD - Standard

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Site:	Sec. 5-T8N-R66W	**MD Reference:**	RKB 25' @ 5217.00ft (H&P 308)
Well:	Christner 8-66-5-3H	**North Reference:**	True
Wellbore:	Plan A Rev 5 SideTrack	**Survey Calculation Method:**	Minimum Curvature
Design:	Sperry MWD Survey	**Database:**	EDM 2003.16 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
6,717.00	5.70	183.526	6,704.59	99.90	-41.00	1,497,125.89	3,192,607.42	40.695932	-104.805398
Tie-On SideTrack to Original Hole at 6717.00 ft									
6,749.00	0.81	179.926	6,736.53	98.08	-41.10	1,497,124.08	3,192,607.34	40.695927	-104.805398
First Sperry MWD Survey (ST1) at 6749.00 ft									
6,781.00	1.01	184.616	6,768.53	97.58	-41.12	1,497,123.58	3,192,607.32	40.695926	-104.805398
6,812.00	2.41	193.262	6,799.51	96.67	-41.29	1,497,122.67	3,192,607.15	40.695923	-104.805399
6,844.00	4.32	199.887	6,831.45	94.88	-41.86	1,497,120.87	3,192,606.60	40.695918	-104.805401
6,876.00	5.50	196.956	6,863.34	92.28	-42.72	1,497,118.26	3,192,605.77	40.695911	-104.805404
6,908.00	6.64	184.701	6,895.16	88.97	-43.32	1,497,114.95	3,192,605.19	40.695902	-104.805406
6,939.00	8.53	174.937	6,925.89	84.89	-43.26	1,497,110.87	3,192,605.28	40.695891	-104.805406
6,971.00	10.27	171.592	6,957.45	79.70	-42.63	1,497,105.69	3,192,605.95	40.695877	-104.805404
7,003.00	12.17	171.904	6,988.84	73.54	-41.74	1,497,099.53	3,192,606.89	40.695860	-104.805401
7,035.00	14.36	172.735	7,019.99	66.27	-40.76	1,497,092.27	3,192,607.92	40.695840	-104.805397
7,066.00	17.34	174.415	7,049.81	57.86	-39.83	1,497,083.87	3,192,608.92	40.695817	-104.805394
7,098.00	20.22	176.145	7,080.10	47.59	-38.99	1,497,073.61	3,192,609.84	40.695789	-104.805391
7,130.00	22.46	177.427	7,109.90	35.96	-38.35	1,497,061.99	3,192,610.58	40.695757	-104.805388
7,160.00	25.26	179.475	7,137.34	23.84	-38.03	1,497,049.86	3,192,610.99	40.695723	-104.805387
7,192.00	28.01	179.643	7,165.94	9.49	-37.92	1,497,035.52	3,192,611.21	40.695684	-104.805387
7,224.00	31.47	181.433	7,193.72	-6.37	-38.08	1,497,019.65	3,192,611.17	40.695640	-104.805387
7,256.00	33.14	182.619	7,220.77	-23.46	-38.69	1,497,002.56	3,192,610.70	40.695594	-104.805390
7,288.00	32.30	181.155	7,247.69	-40.75	-39.26	1,496,985.27	3,192,610.26	40.695546	-104.805392
7,319.00	31.80	180.586	7,273.97	-57.20	-39.51	1,496,968.82	3,192,610.14	40.695501	-104.805392
7,351.00	33.53	181.753	7,300.90	-74.46	-39.87	1,496,951.55	3,192,609.92	40.695454	-104.805394
7,383.00	37.45	183.568	7,326.95	-93.02	-40.75	1,496,932.99	3,192,609.19	40.695403	-104.805397
7,414.00	41.47	185.034	7,350.88	-112.66	-42.23	1,496,913.34	3,192,607.85	40.695349	-104.805402
7,446.00	45.93	184.907	7,374.01	-134.68	-44.15	1,496,891.30	3,192,606.11	40.695288	-104.805409
7,478.00	50.10	184.554	7,395.41	-158.38	-46.11	1,496,867.59	3,192,604.34	40.695223	-104.805416
7,509.00	54.75	184.019	7,414.31	-182.88	-47.94	1,496,843.08	3,192,602.70	40.695156	-104.805423
7,541.00	59.76	184.710	7,431.61	-209.70	-49.99	1,496,816.24	3,192,600.86	40.695082	-104.805430
7,573.00	64.60	183.927	7,446.54	-237.92	-52.12	1,496,788.01	3,192,598.95	40.695005	-104.805438
7,604.00	69.62	184.186	7,458.60	-266.39	-54.14	1,496,759.52	3,192,597.15	40.694927	-104.805445
7,636.00	75.03	184.463	7,468.31	-296.78	-56.44	1,496,729.11	3,192,595.09	40.694843	-104.805454
7,668.00	80.53	184.848	7,475.08	-327.94	-58.98	1,496,697.93	3,192,592.80	40.694758	-104.805463
7,699.00	83.57	183.774	7,479.37	-358.55	-61.28	1,496,667.31	3,192,590.73	40.694674	-104.805471
7,731.00	86.03	182.947	7,482.27	-390.37	-63.15	1,496,635.48	3,192,589.11	40.694587	-104.805478
7,771.40	88.99	182.609	7,484.03	-430.68	-65.11	1,496,595.16	3,192,587.47	40.694476	-104.805485
7" Int. Casing Shoe at 7771.40 ft									
7,802.00	91.24	182.353	7,483.96	-461.24	-66.43	1,496,564.58	3,192,586.39	40.694392	-104.805490
7,898.00	93.33	181.839	7,480.14	-557.10	-69.94	1,496,468.70	3,192,583.63	40.694129	-104.805502
7,992.00	96.31	181.289	7,472.23	-650.72	-72.50	1,496,375.07	3,192,581.81	40.693872	-104.805511
8,087.00	96.00	181.331	7,462.04	-745.15	-74.66	1,496,280.63	3,192,580.39	40.693613	-104.805519
8,183.00	95.94	181.887	7,452.06	-840.59	-77.34	1,496,185.17	3,192,578.45	40.693351	-104.805529
8,278.00	90.25	182.248	7,446.93	-935.35	-80.76	1,496,090.38	3,192,575.78	40.693091	-104.805541
8,373.00	89.63	182.805	7,447.03	-1,030.26	-84.95	1,495,995.45	3,192,572.33	40.692830	-104.805556
8,468.00	88.33	182.913	7,448.72	-1,125.12	-89.68	1,495,900.55	3,192,568.34	40.692570	-104.805573
8,563.00	88.58	183.047	7,451.28	-1,219.96	-94.62	1,495,805.68	3,192,564.14	40.692309	-104.805591
8,659.00	87.16	182.058	7,454.85	-1,315.79	-98.89	1,495,709.82	3,192,560.62	40.692046	-104.805607
8,754.00	88.02	181.921	7,458.84	-1,410.65	-102.19	1,495,614.94	3,192,558.07	40.691786	-104.805618
8,849.00	87.41	181.555	7,462.63	-1,505.53	-105.07	1,495,520.04	3,192,555.93	40.691526	-104.805629
8,944.00	87.28	181.437	7,467.03	-1,600.40	-107.55	1,495,425.16	3,192,554.20	40.691265	-104.805638
9,040.00	89.26	182.460	7,469.93	-1,696.29	-110.81	1,495,329.24	3,192,551.69	40.691002	-104.805650
9,135.00	91.36	182.899	7,469.42	-1,791.18	-115.25	1,495,234.32	3,192,547.99	40.690742	-104.805666
9,231.00	90.00	183.235	7,468.28	-1,887.03	-120.38	1,495,138.43	3,192,543.61	40.690479	-104.805684
9,326.00	88.58	183.284	7,469.46	-1,981.87	-125.79	1,495,043.56	3,192,538.95	40.690218	-104.805704
9,422.00	87.10	183.165	7,473.08	-2,077.65	-131.18	1,494,947.74	3,192,534.30	40.689955	-104.805723

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Site:	Sec. 5-T8N-R66W	**MD Reference:**	RKB 25' @ 5217.00ft (H&P 308)
Well:	Christner 8-66-5-3H	**North Reference:**	True
Wellbore:	Plan A Rev 5 SideTrack	**Survey Calculation Method:**	Minimum Curvature
Design:	Sperry MWD Survey	**Database:**	EDM 2003.16 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
9,517.00	88.21	183.677	7,476.98	-2,172.40	-136.85	1,494,852.95	3,192,529.38	40.689695	-104.805743
9,613.00	89.69	184.256	7,478.74	-2,268.15	-143.49	1,494,757.15	3,192,523.49	40.689432	-104.805767
9,708.00	88.70	185.008	7,480.07	-2,362.82	-151.16	1,494,662.42	3,192,516.56	40.689173	-104.805795
9,803.00	94.33	185.596	7,477.55	-2,457.35	-159.93	1,494,567.83	3,192,508.53	40.688913	-104.805827
9,898.00	95.19	186.263	7,469.67	-2,551.51	-169.71	1,494,473.60	3,192,499.49	40.688655	-104.805862
9,993.00	96.37	184.910	7,460.10	-2,645.58	-178.91	1,494,379.46	3,192,491.03	40.688396	-104.805895
10,088.00	95.57	184.862	7,450.23	-2,739.72	-186.96	1,494,285.26	3,192,483.72	40.688138	-104.805924
10,183.00	93.65	185.163	7,442.59	-2,834.04	-195.23	1,494,190.88	3,192,476.18	40.687879	-104.805954
10,278.00	94.08	185.346	7,436.19	-2,928.43	-203.91	1,494,096.43	3,192,468.24	40.687620	-104.805985
10,374.00	93.15	185.110	7,430.14	-3,023.84	-212.64	1,494,000.95	3,192,460.26	40.687358	-104.806017
10,469.00	91.85	183.271	7,425.99	-3,118.49	-219.58	1,493,906.25	3,192,454.07	40.687098	-104.806042
10,564.00	89.75	182.512	7,424.66	-3,213.35	-224.37	1,493,811.36	3,192,450.02	40.686838	-104.806059
10,660.00	90.49	183.475	7,424.45	-3,309.22	-229.38	1,493,715.45	3,192,445.76	40.686575	-104.806077
10,755.00	87.53	182.296	7,426.09	-3,404.07	-234.16	1,493,620.57	3,192,441.72	40.686315	-104.806094
10,851.00	86.17	182.204	7,431.37	-3,499.85	-237.92	1,493,524.76	3,192,438.71	40.686052	-104.806108
10,946.00	85.12	182.646	7,438.59	-3,594.49	-241.93	1,493,430.10	3,192,435.44	40.685792	-104.806122
11,041.00	89.20	181.983	7,443.30	-3,689.27	-245.76	1,493,335.29	3,192,432.36	40.685532	-104.806136
11,136.00	88.39	181.115	7,445.30	-3,784.22	-248.33	1,493,240.33	3,192,430.53	40.685271	-104.806145
11,231.00	90.56	182.133	7,446.17	-3,879.17	-251.02	1,493,145.36	3,192,428.58	40.685011	-104.806155
11,327.00	90.99	182.229	7,444.88	-3,975.09	-254.68	1,493,049.41	3,192,425.68	40.684747	-104.806168
11,375.00	91.67	182.325	7,443.77	-4,023.04	-256.58	1,493,001.45	3,192,424.15	40.684616	-104.806175
Final Sperry MWD Survey (ST1) at 11375.00 ft									
11,420.00	91.67	182.320	7,442.46	-4,067.98	-258.40	1,492,956.50	3,192,422.68	40.684492	-104.806182
Straight Line Projection to TD (ST1) at 11420.00 ft									

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Site:	Sec. 5-T8N-R66W	**MD Reference:**	RKB 25' @ 5217.00ft (H&P 308)
Well:	Christner 8-66-5-3H	**North Reference:**	True
Wellbore:	Plan A Rev 5 SideTrack	**Survey Calculation Method:**	Minimum Curvature
Design:	Sperry MWD Survey	**Database:**	EDM 2003.16 Single User Db

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Christner 8-66-5-3H_S	0.00	0.00	0.00	0.00	0.00	1,497,026.32	3,192,649.20	40.695658	-104.805250
- survey misses target center by 6705.46ft at 6717.00ft MD (6704.59 TVD, 99.90 N, -41.00 E)									
- Point									
Christner 8-66-5-3H_S	0.00	0.00	0.00	0.00	0.00	1,497,026.32	3,192,649.20	40.695658	-104.805250
- survey misses target center by 6705.46ft at 6717.00ft MD (6704.59 TVD, 99.90 N, -41.00 E)									
- Polygon									
Point 1			0.00	-4,122.99	3,124.38	1,492,927.99	3,195,805.75		
Point 2			0.00	-2,103.56	3,143.68	1,494,947.49	3,195,809.23		
Point 3			0.00	-352.57	3,161.02	1,496,698.54	3,195,812.85		
Point 4			0.00	-351.39	1,142.90	1,496,683.90	3,193,794.81		
Point 5			0.00	-350.21	-875.09	1,496,669.27	3,191,776.89		
Point 6			0.00	-4,070.27	-948.51	1,492,948.80	3,191,732.62		
Point 7			0.00	-4,097.88	1,080.57	1,492,937.09	3,193,761.83		
Point 8			0.00	-4,122.99	3,124.38	1,492,927.99	3,195,805.75		
Christner 8-66-5-3H_S	0.00	0.00	0.00	0.00	0.00	1,497,026.32	3,192,649.20	40.695658	-104.805250
- survey misses target center by 6705.46ft at 6717.00ft MD (6704.59 TVD, 99.90 N, -41.00 E)									
- Polygon									
Point 1			0.00	-4,722.99	3,724.39	1,492,332.72	3,196,410.43		
Point 2			0.00	-2,103.56	3,743.68	1,494,952.19	3,196,409.20		
Point 3			0.00	247.43	3,761.02	1,497,303.21	3,196,408.12		
Point 4			0.00	248.61	1,142.89	1,497,283.88	3,193,790.10		
Point 5			0.00	249.78	-1,475.09	1,497,264.54	3,191,172.22		
Point 6			0.00	-4,670.28	-1,548.51	1,492,344.12	3,191,137.35		
Point 7			0.00	-4,697.88	1,080.57	1,492,337.12	3,193,766.53		
Point 8			0.00	-4,722.99	3,724.39	1,492,332.72	3,196,410.43		
Christner 8-66-5-3H_F	0.00	0.00	7,471.90	-4,083.40	-252.11	1,492,941.13	3,192,429.10	40.684450	-104.806159
- survey misses target center by 33.83ft at 11420.00ft MD (7442.46 TVD, -4067.98 N, -258.40 E)									
- Point									

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
6,717.00	6,704.59	99.90	-41.00	Tie-On SideTrack to Original Hole at 6717.00 ft
6,749.00	6,736.53	98.08	-41.10	First Sperry MWD Survey (ST1) at 6749.00 ft
7,771.40	7,484.03	-430.68	-65.11	7" Int. Casing Shoe at 7771.40 ft
11,375.00	7,443.77	-4,023.04	-256.58	Final Sperry MWD Survey (ST1) at 11375.00 ft
11,420.00	7,442.46	-4,067.98	-258.40	Straight Line Projection to TD (ST1) at 11420.00 ft

Checked By: _____ Approved By: _____ Date: _____